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SMARA UPDATE

The Quarterly Newsletter of the Department of Conservation - Office of Mine Reclamation

Gravel Bar Skimming: Tradition and Techniques

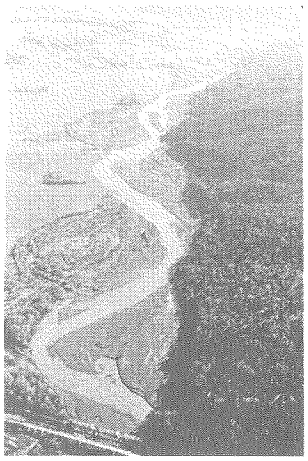

Photo by Michael Sandecki

The north coast of California is unique in that erosive terrain, intensive land use and wet winters combine to provide heavy sediment loads to rivers which are largely undammed and flow freely to the ocean. The large sediment loads may replenish sand and gravel to mined gravel bars during floods each winter. Some northern California gravel operators have been mining at the same gravel bars since the 1950s.

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In mining sand and gravel for construction aggregate, the trend of ***aggradation***, or filling of the riverbed with gravel deposits, is reduced. With excessive aggradation, the low flow channel can braid into several unstable channels. When this occurs, fish passage becomes difficult because a large fish may not have adequate depth to swim past a gravel bar. Also, pools along the channel which normally would provide cool, slack water for a fish to rest, may become filled with sediment. The preservation of the pool-riffle sequences is of utmost consequence to fish and can be addressed, in part, by gravel extraction.

Many north coast mining sites could provide gravel indefinitely given three critical operating elements: maintenance of the geomorphic and hydraulic site characteristics through prescriptive grading of the gravel bars, adequate data collection programs, and adaptive management exercised by trained professionals. This article discusses the first item--how to mine gravel yet retain geomorphic and hydraulic site characteristics--and explains the importance of retaining these characteristics.

Generally speaking, northern California streams are ***graded channels***, maintaining an equilibrium form that adjusts the channel geomorphology to the sediment load. The ***hydraulic efficiency*** of each length of the river--its ability to transport sediment--is dependent on the geomorphic processes that control the channel shape. The form of the channel, where not controlled by bedrock or human intervention, is shaped by two-year recurrence floods. The two-year recurrence floods happen frequently, fill the channel to its bankfull width, and do the most work to shape the channel. It is actually for these smaller floods that we design our gravel mining prescriptions because large floods tend to override any effect of gravel mining.

In northern California rivers, the presence of anadromous fish has focused special concern on environmental impacts of mining streambeds. In fact, recent listing of the Coho salmon (*Oncorhynchus kisutch*) as "endangered" under the Endangered Species Act has renewed interest in completing a

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comprehensive examination of land use policies that might impact fish, which includes an evaluation of instream mining activities. Anadromous fish require, among other things, a fish-passage-friendly channel configuration. This requirement has focused the efforts of gravel extractors to improve channel complexity and pool-riffle sequences, and encourage the development of streamside vegetation.

One thing we can say for certain is that we do not want to be trapped in a web of good intentions when it comes to manipulating a river through gravel extraction. Rerouting the low flow channel to a different location or excavating trenches or pits in the channel interrupts the hydraulic efficiency of the channel, causing the sediment load to drop out of transport in different locations and resulting in accelerated erosion and deposition of sediment in new areas. The interruption of sediment transport may also trap too much of the cumulative sediment load within the mining reach, inhibiting the downstream flux of sediment. When this happens, the clear, sediment-free water flowing downstream strives to expend its new-found energy by eroding the downstream channel banks and bed.

The most advantageous gravel extraction prescriptions mimic the natural geomorphic and hydraulic conditions and copy gravel bar configurations found at the unmined bars in the area. In practice, this means leaving in place the planform of the river. Gravel bar skimming is the best known approach that accommodates this need. The term ***"gravel bar skimming"*** means removing shallow lifts of material parallel to the low water surface of the exposed dry gravel bars during the hot, dry summer months when the river stage is low.

The gravel bar skimming approach is not new, but there are new thoughts about bar skimming to further preserve natural conditions in the river. Bar skimming operations in the past too often left the bar flat, allowing low flows to spread thinly over the scalped gravel bar. This resulted in a recovery period during which multiple, braided channels persisted and the pool-riffle sequence was lost.

A recent addition to the traditional skimming technique is to leave a buffer at the head (upstream end) of the gravel bar. The smaller sand and gravel is winnowed out by high winter flows, leaving the gravel bar, especially at its upstream end, with a course armor or lag deposit which is resistant to erosion. When left as a buffer, it is often not eroded until very high flows occur. Generally, about a quarter to a fifth of the bar should be left intact.

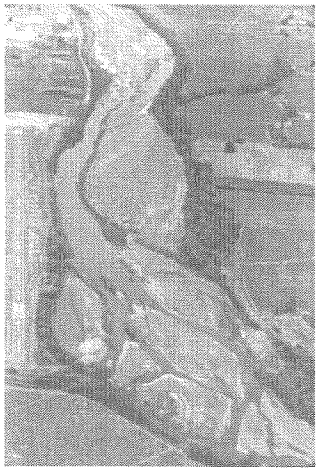

FIGURE 1: Recovery of the pool-riffle morphology and low flow channel following skimming of gravel bars on the Russian River. The top bar is recently mined and no clear channel is visible. The natural channel geometry has partially recovered at the gravel bar in the foreground which has multiple channels. The gravel bar in the middle is fully recovered and displays a good pool-riffle sequence. Multiple channels can be avoided by retaining buffers to preserve river geomorphology.

Photo by Michael Sandecki

What the buffer does is set up a mini-dam in the river. When water hits the dam it creates slack water behind the dam causing sand and gravel to deposit. This process is similar to natural bar formation where gravel bars migrate downstream by incremental addition of gravel to their downstream ends.

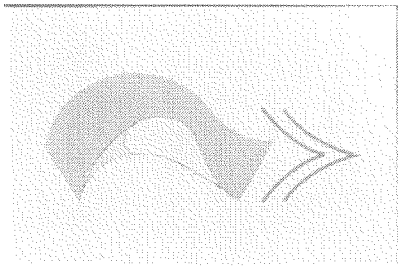

FIGURE 2: Plan view diagram showing the correct configuration of a bar-head buffer. Arrow indicates the downstream direction of river flow.

Diagram by Michael Sandecki

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Message From The Director

Larry Goldzband

On August 14, the State Mining and Geology Board held a special meeting in El Dorado County to examine whether the county is fulfilling its obligations as a lead agency under the Surface Mining and Reclamation Act. Having heard from local residents, the county and representatives from the Department of Conservation, the board will be weighing the difficult decision of whether to assume administration of SMARA in the county.

Although the board's decision isn't likely to come before its November meeting, there are a number of things both the Department of Conservation and lead agencies can learn from this situation.

There are two distinct issues in the El Dorado County matter: First, a closure notice -- rendered moot, at least temporarily, by a series of stays granted in Sacramento Superior Court -- issued by the Department of Conservation against a long-term noncompliant mine operator; and second, the board's examination of the county's failure to approve adequate reclamation plans and financial assurances for the operator's mines.

This demonstrates how difficult it is to enforce SMARA. Lead agencies have a role, the state has a role, and together they face the challenge of ensuring that mining operations do not result in negative impacts on public health and safety or the environment. The state wants a consistent regulatory approach to SMARA, and it must have lead agency cooperation to achieve this.

Perhaps the larger issue, however, is that we now see first hand the ability of a mine operator to get the judiciary to step in and suspend actions the department, the board or the lead agencies may take in enforcing SMARA.

The best way to avoid legal action is to make the regulatory structure -- embodied by the state and the lead agencies -- as seamless as possible. The more play we allow in the structure, the less certainty there is. The more opportunity we leave for ambiguity, the greater the chance for someone to use the courts to get around this important environmental law.

The onus is on the lead agencies and the state to continue improving the current system, and in the true spirit of partnership make SMARA a law that works.

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A second addition to traditional streambed skimming is to leave a buffer alongside the low flow channel. This confines the low water channel between streambanks so that it will efficiently carry its sediment load downstream during lower flows when the river is carrying little sediment. This setback is measured vertically from the low water surface and is usually on the order of one or two feet. By the time the flood water rises above the elevation of the buffer, the river will be transporting much more sand and gravel and some of this sediment load can be spared to deposit on the bar and replenish the mining site.

Although the vertical buffer along the low flow channel is important for confining the channel during lower flows, the horizontal element of the buffer is also important. Young fish tend to hold right along the edge of the bar where the water is slower and they won't be swept downstream. The juveniles also stay at the edge of the gravel bar because the water is too shallow for the large fish that would like to eat them. The horizontal buffer keeps the heavy equipment used in mining the gravel bar far enough away as to not disturb the small fish at the edge of the gravel bar.

The buffer left along the low flow channel also may allow riparian vegetation saplings such as willow, alder and cottonwoods to persist and mature into riparian forest. The canopy provided by riparian vegetation shades the channel during the summer, keeping water temperature cool for the native fish which require lower water temperatures. Vegetation allows insects to flourish and provide food to the fish population. Eventual erosion of the riparian areas will introduce woody debris to the river. Woody debris introduces complexity to the channel, again improving habitat values.

Michael Sandecki, Engineering Geologist

Abandoned Mines Program and Task Force Established

The Department of Conservation is now host to a new abandoned mine program effort that will identify, characterize and prioritize abandoned mine sites throughout California. As many as 20,000 abandoned mine sites, a number of which may pose significant threats to public health and safety, exist throughout the state. Until now, there has been no concerted effort to either identify or mitigate this problem, due to lack of funding and the potential liability risks posed to governmental agencies.

To help develop statewide policy for this new program, the Department is sponsoring an Abandoned Mines Task Force, comprised of representatives from state agencies that have abandoned mine issues within their purview. The immediate task of this new policy group is to advise on the development of a statewide inventory of abandoned mines. Once all sites have been identified and characterized by risk factors (yet to be developed), the task force will also help with prioritizing abandoned mine sites for remediation.

Currently, the task force is reviewing abandoned mine inventory forms used by other states to develop a form that works best for California, reviewing existing statutes, and assessing members' needs to develop a uniform definition for "abandoned mine lands." Policy and information developed by the task force will provide the foundation for the department's new Abandoned Mine Inventory and Characterization Program.

The meetings are open to the public and are held monthly. Interested federal agencies, local governments, industry representatives and the general public are welcome to attend.

The new program will be discussed in more detail in an upcoming issue of the *SMARA Update*.

Reclamation Tips

Winterizing

Winterizing the mine site is an important reclamation treatment for most surface mines in California. Excluding the southern desert areas, most erosion at mine sites occurs during the winter rainy season. Therefore, yearly winterizing of the mine site should be addressed under the erosion control portion of the reclamation plan.

The reclamation plan should discuss what, when and where erosion control treatments will be placed prior to the rainy season:

What: The erosion control plan should describe what type of treatments will be installed on site. Some of the common treatments include placement of hay bales or building diversion berms and check dams.

When: For monitoring purposes, it is very important that the erosion control plan specify when the treatments will be in place. Typically, the plan will specify that the "treatments will be in place by no later than mid-October."

Where: The site plan is the logical place to show the location of the proposed erosion control treatments. Symbols for the various treatments can be used and a legend included on the plans that explains what each symbol represents. The configuration of the mine site is always changing and, as a consequence, so will the location and type of erosion control treatments used. Ideally the site plans will show mine phases and the requisite phasing of treatments.

For the following example, a side-hill hard rock quarry will be used to illustrate common winterizing practices. Prior to the rainy season, fine-grained material stockpiles (salvaged topsoil, waste rock, product piles) should be sloped to 2:1 (horizontal or vertical) or gentler. Erosion control grass seed should be applied to stockpiles. Diversion berms or interceptor ditches may need to be installed above vertical faces to divert surface runoff from the face. Level areas should be back sloped so that water is contained on site in retention basins, or provisions made for nonerosive off-site discharge. Haybales may need to be trenched and staked into small drainage swales. Water bars should be installed on sloping access roads. Some of the work that needs to be done to winterize the mine site falls under good housekeeping. For example, culverts should be checked to make sure they are clean and sediment retention basins should be cleaned out, made ready for winter's onslaught of sediment laden water.

Cathy Gaggini,
Engineering Geologist

Soil Compaction

Editor's Note: The following is an excerpt from "Rehabilitation of Disturbed Lands in California: A Decision-Making Guide," by Gail Newton and Vic Claassen (Department of Conservation publication in preparation).

Natural soils typically have an open pore structure, which allows air to diffuse in and out and allows water to infiltrate quickly. The soil particles are loosely packed and held in place by organic matter, roots and fungal hyphae. When soils are modified by tillage, traffic or excavation, the particles become closely packed and the soil becomes compacted. Soils with low organic matter content are especially susceptible. Compaction decreases soil aeration, reduces the ability of the soil to hold and release water, creates a higher flux in soil temperatures and increases the difficulty of root penetration.

After the soil has been compacted, precipitation is less likely to percolate through the soil, providing less plant available moisture, and more likely to run overland and off the site. These two outcomes may stunt growth and increase mortality. Thus, compaction can result in the failure of an otherwise well-executed rehabilitation plan.

The natural rate of loosening of a compacted soil is determined by the degree and depth of compaction, the overall texture of the soil, the amount of clay in the soil, the amount and depth of water penetration, the level and type of biological activity of the soil and the climate (e.g., freeze-thaw cycles). The degree and depth of compaction will increase if the soil is disturbed while wet (Voorhees *et.al* 1986). Soils, such as wetland soils, that are saturated and high in clay, are extremely prone to compaction. Once compacted, wetland soils will remain compacted for decades and cannot be loosened because they never adequately dry out.

Compacted soils can be mechanically loosened by deep ripping while the soil is dry (Steed *et. al* 1987, Bainbridge 1993) and should be done without inverting the soil horizons. A chisel plow, mould-board plow, or 32-inch disk can be used to achieve deep ripping of compacted soils; however, the latter two may invert the soil profile. The more common attempts with a smaller disk, rototiller, or standard plow usually fail to adequately loosen the soil below the top few inches. Tillage or deep ripping of a compacted soil will open up cracks in the soil profile, but without further development of soil structure these ripped soils will settle and repack within a year or two. Calcium, organic matter and reestablishment of a vegetative cover will start the process of soil structure redevelopment.

The best method to ensure a noncompacted site is to take measures not to compact the soil in the first place. Measures that can be taken to minimize or avoid compaction are to:

(1) work soils when dry,
(2) keep people and vehicles off or minimize the number of trips,
(3) use lighter equipment that will place less weight on the soil,
(4) use large tires on equipment to disperse the weight over a larger area, and
(5) add organic matter to soils while working or moving the soil.

Gail Newton
Env. Services Unit Manager

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Steed, G.R., T.G. Reeves, and S.T. Willatt. 1987. Effects of deep ripping and liming on soil water deficits, sorptivity and penetrometer resistance. Aust. J. Exp. Agric. 27:701-705.

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Executive Officer's Report

At its July 10, 1997 regularly scheduled business meeting held in Sacramento, the State Mining and Geology Board took the following actions on these SMARA issues:

1. Approved a request by Clifford R. Brown Engineering for an exemption from SMARA pursuant to PRC § 2714(f) for a project at Plumas Pines (Plumas County) for corrective channel work in and along the banks of the Middle Fork of the Feather River.

2. Denied a request by Clifford R. Brown Engineering for an exemption from SMARA pursuant to PRC § 2714(f) for a project near Graeagle Bridge (Plumas County) for corrective channel work in and along the banks of the Middle Fork of the Feather River.

3. Adopted regulatory language amending Title 14, Division 2, § 3501 and § 3505 of the California Code of Regulations regarding the definition of farming activities that are exempt from SMARA.

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4. Approved the reclamation plan for the Peck Road Gravel Pit, California Mine ID # 91-19-0043, operated by SLS&N, Inc. within the City of Monrovia. SMARA delegates lead agency authority for the approval of reclamation plans and financial assurances to the board in cases where the lead agency does not have a certified mining ordinance.

5. Adopted Resolution #97-07 certifying the City of Monrovia's surface mining ordinance #97-03. (NOTE: Following this action, the board remanded administration of the reclamation plan and financial assurances approved for the Peck Road Gravel Pit back to the city.)

6. Conducted a public hearing to receive comments on draft surety bond forms proposed to replace those forms currently in use. The draft forms were referred to the Financial. Assurances Committee for further review, and are scheduled for board action later this year.

7. Accepted Open File Report 97-02, Mineral Land Classification of Concrete-Grade Aggregate Resources in Glenn County, California.

8. Accepted Open File Report 97-09, Mineral Land Classification of a Portion of Tuolumne County, California, for Precious Metals, Carbonate Rock, and Concrete-Grade Aggregate.

The board took the following actions regarding appeals of administrative penalties assessed by the department:

A. Tepusquet Quarry, CA Mine ID # 91-42-0009, Henry Antoloni, Agent, Santa Barbara County -- modified a $10,000 penalty, requiring the operator to pay a $2,500 penalty and to submit required reclamation plans and financial assurances to the county by September 16, 1997, or be subject to an additional penalty amount of $7,500.

B. Konocti Rock, CA Mine ID # 91-17-0017, Clearlake Lava, Inc., Bill Van Pelt, Agent, Lake County -- continued hearing on $10,000 penalty, and requested county and operator to submit a joint plan for site regrading and cleanup for consideration at the September board meeting.

C. Lang Station, CA Mine ID # 91-19-0030, Curtis Sand & Gravel, Ben Curtis, Agent, Los Angeles County -- increased a $5,000 penalty to $10,000 for failure to provide proof of financial assurances.

On August 14, 1997 the board held a special public meeting in Placerville to receive public comments regarding El Dorado County's alleged failure as a lead agency to enforce the Surface Mining and Reclamation Act (Public Resources Code §2710 et seq.). The meeting was conducted by a panel of four board members, and attended by 123 mine operators, contractors, county officials, and representatives of the Department of Conservation and the State Attorney General's office. This hearing was the result of formal complaints received by the board regarding the county's alleged failure to enforce SMARA against the operator of the Weber Creek Quarry. The board will discuss the information obtained during this hearing at its September 11 regular business meeting, and is expected to take final action at its November meeting.

John G. Parrish, Ph.D.
Executive Officer

Compliance Corner

Do mine operators really have to adjust their financial assurances every year?

Yes. SMARA § 2773.1(a)(3) requires that financial assurances be reviewed annually by lead agencies for each mining operation. Annual review ensures that funds available for mined land reclamation remain sufficient to account for newly disturbed lands (or pending disturbance in the coming year). Even if the operation has remained idle, each operation must nevertheless undergo the annual review process to ensure that inflation, site degradation, etc. are taken into account..

Each year, operators should assess their operations for newly disturbed and reclaimed acreage, and prepare a written reclamation cost estimate for each site. The State Mining and Geology Board has adopted regulations addressing requirements for financial assurance mechanisms (found in §3800 of the California Code of Regulations). The board has also developed *Financial Assurance Guidelines* to assist in both the calculation of various reclamation activities and in preparing suitable financial assurance mechanisms. Copies may be obtained by calling the Office of Mine Reclamation at (916) 323-9198.

Estimates are submitted to the operator's lead agency for preliminary review, after which they are forwarded by the lead agency to OMR for comment. OMR will provide comment within 45 days. Lead agencies must consider OMR's written

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Tips For Reviewing Cost Estimates

It's been said that reviewing cost estimates is about as fun as having your teeth pulled. Now, reviewing cost estimates can be tedious, but it isn't really that bad. Besides, think of the all trouble and agony the person who put the estimate together went through. And if you were to ask any of the lead agencies that have had to rely on a financial assurance to reclaim a site, they'd be the first to say that ensuring an accurate cost estimate is actually pretty important.

Realizing that most reviews are completed by planners and not engineers or cost analysts, it is not expected that the typical reviewer will be familiar with engineering formulas and equipment ratings. Keep in mind, though, that just because you may not know how much dirt a bulldozer can move in an hour does not mean you can't review a cost estimate. Don't be afraid to ask questions if you are not sure. Most operators don't mind spending a little time explaining how things work. And if you remain unconvinced, have the operator provide additional documentation to support the figures in the estimate.

If there is still some trepidation remaining, try using the cost estimate worksheet developed by the Office of Mine Reclamation and adopted into the Financial Assurance Guidelines earlier this year. The worksheet was designed to help both the preparer and the reviewer by providing a clear and simple format that lays out the various steps that should be followed when determining reclamation costs. It even comes with instructions, something never provided before.

A critical first step to reviewing a cost estimate is to review the reclamation plan and conditions of approval to determine the individual reclamation tasks that need to be completed. The most recent inspection report should also be looked at to verify the amount of disturbed acreage and to make sure there are no outstanding violations or other issues that should be given special consideration in the estimate.

With pencil and paper ready, list all the various reclamation tasks that can be identified from the plan and conditions of approval. As you prepare this list, think of all the different steps that need to be done to complete each task. It's surprising to find how long the list ends up being. In fact, when reviewing estimates that have been forwarded to OMR, our comments often include pointing out reclamation tasks that have been overlooked by the operator.

Once the list is completed check it against the estimate to determine if the operator has identified all of his reclamation tasks. If the estimate is so general that it does not provide this information, send the estimate back to the operator and request that it be amended to identify all the tasks on your list. Following this simple procedure should dramatically improve the quality of cost estimates being submitted for review.

Another basic step to your review is to check the math. It sounds a bit silly in the age of computer spreadsheets and calculators, but math errors are common and they don't always occur in the operator's favor. Its nice to be able to call the operator in those instances and tell him you can save him some money.

Determining if the costs for labor, equipment and materials are correct is a little more difficult. Remember that the estimate should be prepared on the basis of a third party's cost to complete reclamation. Therefore, some familiarity with average equipment and material costs is necessary, otherwise completing the review may feel like being a contestant on the television game show "The Price Is Right."

To get an idea of these costs simply call a few local equipment rental businesses and ask them to mail or fax a copy of their equipment price sheet. Not to ring Caterpillar Tractor's bell, but they have dealerships located throughout the state. There is usually a person assigned as a government sales representative at each dealership and these individuals tend to be very knowledgeable and helpful. Another good source for this type of information may be your county or city public works department.

Equipment rates are generally based on daily, weekly and monthly lease terms. The longer the term of the lease, the lower the average hourly rate becomes. For example, according to the price sheet for Quinn Caterpiller in Bakersfield, the daily rental rate for a D-8 bulldozer is $1,150 or $143.75 per hour. The monthly rental rate is $14,000 or $79.55 per hour (based on a 176-hour month). The number of hours needed to complete the reclamation work will help determine the equipment rate that should be used in the estimate. Be aware that equipment rates can vary considerably on a regional basis.

The same method of calling a few suppliers can be used to determine the cost for materials, particularly plant and seed materials. There is a very

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Tips for Reviewing Cost Estimates

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useful publication prepared by OMR revegetation experts entitled "Nursery Sources for California Native Plants" (DMG Open File Report 90-04, Revised 1995). Among the information provided in this publication is a list that gives the address, phone number and contact name for 118 seed and plant suppliers located throughout California. Many of these suppliers are willing to provide price quotes over the phone for materials they handle. This publication can be ordered from the Division of Mines and Geology for a nominal fee of $10 per copy.

The cost for labor is another one of those items that is dependent on regional economic conditions. When SMARA was first amended to require financial assurances, OMR recommended using prevailing wage rates. However in late 1993, the Department of Industrial Relations issued an opinion that forfeited financial assurance money used to reclaim a mine site would not constitute a public works project and therefore should not be subject to prevailing wage requirements. As a result, we now recommend that labor costs reflect the local labor rates of your area. If for some reason your agency requires that prevailing wage rates be used, these rates can be found on the inside back cover of R.S. Means "Site Work & Landscape Cost Data", which is published on an annual basis. An even better source for this information is the Department of Industrial Relations' web page (www.dir.ca.gov/DIR/S&R/prevwage.html), which provides up-to-date prevailing wages for each county in the state.

As an aside, some lead agencies have adopted standardized costs for certain reclamation tasks. This method of estimating can work if the mines located within the jurisdiction are all very similar (i.e. aggregate mining on floodplains), are located within reasonable proximity to each other and the costs are tied to a consumer price index to ensure they stay current with inflation. Problems with this method can arise when new or different types of mining operations are permitted due to stricter reclamation standards or different reclamation methods (hardrock vs. placer). Also, regional cost fluctuations can occur within the borders of larger jurisdictions.

Major Steps to Estimating Reclamation Costs

Identify Reclamation Tasks
- Approved Reclamation Plan
- Conditions of Approval

Estimate Direct Reclamation Costs
- Primary Reclamation Tasks (e.g., earthmoving)
- Revegetation
- Plant Structures and Equipment Removal
- Monitoring

Estimate Indirect Reclamation Costs
- Supervision
- Profit and Overhead
- Contingencies
- Mobilization & Demobilization
- Lead Agency Administrative Costs

Calculate Total Financial Assurance Amount

Probably the most difficult part of reviewing a cost estimate is verifying the salvage value of plant structures and equipment. Salvage value can be very subjective, similar to what you think your used car is worth, so stick to the basics. The Financial Assurance Guidelines indicate that salvage value may be used to offset the cost of reclaiming plant structures, equipment and related facilities. In this context the term salvage value means the value of plant structures and plant equipment after they have been removed for sale or use off-site. Therefore salvage value should only be used to offset the cost of reclaiming those items that have value after demolition and/or reclamation.

For example, a metal storage building with a concrete foundation would typically have a salvage value for the metal portion of the building but not the foundation which normally has to be broken up and hauled to a landfill. The cost to demolish and dispose of concrete foundations, underground structures (i.e. septic systems, wells, and storage tanks) as well as ripping and grading compacted plant areas should be identified in the cost estimate.

Before going further with this discussion there are two important points that each lead agency should consider when allowing salvage value offsets. First, establishing a salvage value does not guarantee that plant structures and equipment will be removed from a site. Salvage value is only the estimated worth of used plant equipment and structures and presumes that someone somewhere will want to buy them, which is not always the case. Second, and more importantly, is that the plant structures and equipment should be owned outright by the operator. There should be no mortgages or liens against the property which could prevent their sale in the case of an abandonment.

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Tips for Reviewing Cost Estimates

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Considering the above, you may refer to the Financial Assurance Guidelines for the specific details of how salvage value should be determined. Briefly put, the guidelines recommend making sure the estimate includes the following two things: 1) a detailed accounting of the cost to demolish or dismantle the plant structures and equipment and remove the material from the site (it should not be assumed that the salvage value will be greater than the reclamation cost without first determining what that cost would be); and 2) a letter of agreement, signed contract, bid or quote from an independent company which provides industrial dismantling or equipment salvage services, or is in the business of buying and selling scrap metals or similar products, and which details the equipment and/or material that would be salvaged and the corresponding salvage value. The operator should not be allowed to determine the salvage value of his own equipment.

Some general rules of thumb to keep in mind when reviewing cost estimates are that earthmoving tasks tend to be the lion's share of overall primary reclamation costs. Therefore keep an eye out for low estimates in the amount of material to be graded or backfilled. When looking at the cost for revegetation, remember that much of this work has to be done by hand so labor costs tend to be higher in this category than in others. And finally, the remoteness or difficulty in accessing a site can dramatically increase the cost of mobilizing equipment and personnel to it.

In terms of what area of the mining operation should be covered by the financial assurance there still seems to be some confusion. The estimate should cover the cost of reclaiming existing disturbed areas of the mine site plus any new area the operator reasonably expects to mine or disturb in the upcoming year. Unless it is a policy of the lead agency, the operator need not provide financial assurance for the entire permitted mine site if it has not been disturbed.

Last, but not least, is the question of how long do lead agencies have to complete their review of a financial assurance cost estimate. Surprisingly, SMARA does not mandate a lead agency review period for cost estimates. However Section 2770(d) limits a lead agency's review period for the financial assurance, or the actual funding mechanism, to 60 days. Because the cost estimate and financial assurance are so closely tied together, it is recommended that the review of the cost estimate be completed within the same time frame as the financial assurance.

Andrew Rush
Environmental Specialist II

Compliance Corner

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comments before approving the reclamation cost estimate.

If the revised reclamation estimate exceeds the existing financial assurance amount, a new or amended financial assurance must be obtained. The original is usually kept on file with the operator's lead agency; a copy, and proof of lead agency approval, must be submitted to OMR. Proof of approval may include planning commission minutes summarizing the action to approve the amount, or a letter from the lead agency.

Financial assurance mechanisms may take the form of surety bonds, irrevocable letters of credit, or trust funds. Public agencies may also employ a pledge of revenue or budget set-aside to meet this requirement.

Up-to-date financial assurances must remain in force during any idle periods and until the lead agency notifies OMR that reclamation has been completed in accordance with the approved reclamation plan. If a mining operation changes ownership, the existing financial assurance must remain in place until a new financial assurance is secured by the new owner.

The annual review of financial assurances provides benefits to the operator and minimizes adverse impacts on the environment. The operator is reacquainted with the specifics of his/her reclamation plan, and provides an opportunity to avoid SMARA violations and it encourages concurrent or phased reclamation which is more timely and cost effective for the operator. In addition, annual reviews help to assure that sufficient funds are available to reclaim mined lands, to prevent adverse environmental effects and to protect public health and safety.

Cam Downey
Compliance Engineer

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Director: Lawrence J. Goldzband
Chief Deputy Director: B.B. Blevins
Deputy Director: Pat Meehan
Assistant Director for OMR: Dennis J. O'Bryant
Newsletter Editor: Deborah Herrmann

Department of Conservation
OFFICE OF MINE RECLAMATION
801 K Street, MS 09-06
Sacramento, CA 95814